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Research Article

**STUDY TO REVEAL THE RELATIONSHIP AMONG  
NUTRITIONAL CONSUMPTION AND IRON DEFICIENCY  
ANEMIA IN POPULATION OF BAHAWALPUR****Dr Arfa Rahman<sup>1</sup>, Dr Kainat Zainab<sup>2</sup>, Dr Sameer Zafar<sup>3</sup>**<sup>1</sup>Quaid e Azam Medical College Bahawalpur<sup>2</sup>King Edward Medical University, Lahore<sup>3</sup>Sharif Medical and Dental College, Lahore**Article Received:** September 2020    **Accepted:** October 2020    **Published:** November 2020**Abstract:**

**Objective:** The aim of our study was to conclude the relationship among nutritional consumption and iron deficiency anemia and to distinguish the different means for calculating the nutritional status.

**Study design:** A cross-sectional study.

**Time and Duration:** We conducted this study at Bahawal Victoria Hospital Bahawalpur for the duration of 06 months starting from January, 2020 to June, 2020.

**Methodology:** They were selected by simple random sampling living in during the study period. Data collection procedure: Data was collected by taking the history and physical examination of cases and taking their weight and height. Data was analyzed through SPSS version 21 and entered in proforma.

**Results:** The 38.43% of the participants were having anemia, among them 21.76% of the participants were having mild anemia, 15.74% of the participants were having moderate anemia and 0.93% of participants were having severe anemia. The 34.25% of participants were underweight and 9.7% participants were overweight. More than 55% of females were suffering from anemia. This distinguished class indicates the percentage of anemic patients.

**Conclusion:** Anemia was most frequent in the feminine members of posed population. The disease was significantly related with the consumption of meat and other dietary elements.

**Keywords:** Underweight, General Population, Iron deficiency anemia, Nutritional status.

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**INTRODUCTION:**

Despite the efforts of government and non-government organizations, nutritional deficiencies and anemia remains a major public health problem especially in people with low socio-economic status [1]. Anemia is usually described as a decrease in the amount of red blood cells (RBCs) or hemoglobin in the blood [2].

Iron deficiency is thought to be the most common cause of anemia globally, but other nutritional deficiencies (including folate, vitamin B12 and Vitamin A), acute and chronic inflammation, parasitic infections and inherited or acquired disorders that affect hemoglobin synthesis, red blood cell production or red cell existence, can all cause anemia. Hemoglobin concentration alone cannot be used to diagnose iron deficiency. However, the prevalence of anemia is an important health indicator and when it is used with other measurements of iron status the hemoglobin concentration can provide information about the severity of iron deficiency [3,4,5].

Heme iron found in meat, fish and poultry, is much better captivated than non-heme iron, which is found in eggs, grains, vegetables and fruits [3,4]. Liver, kidney, beef, chicken, tuna, egg yolk, iron- fortified cereals, dried fruits, nuts, dried peas, beans and dark green leafy vegetables are among the foods that rank highest in iron content.

Foods that contain tannins, including coffee and tea, can reduce non-heme iron absorption by 50 to 60 percent. Legumes and grains contain substances called phytates that limit iron absorption, and certain proteins found in soybeans also have this effect. Phosphates, which are found in some types of soda, calcium and fiber may also hinder iron absorption [2]. Processed wheat bran can also play role in the absorption of iron. Dairy products also help to absorb more iron if your iron levels are low. Vitamin C with iron-rich foods will help to absorb the iron more frequently [5].

Orange juice with your meal enhance the absorption of iron in body. Addition of meat servings during meal times also help to enhance the absorption of iron [15]. Avoid use of tea with meals because it is the major fact to reduce the amount of iron that is absorbed in body. The majority of phenolic compounds are found in the leaves, stems and flowers and highly reactive to form iron-phenolic complexes in the intestine then iron less available for absorption [1].

Recently, there has been increasing interest from epidemiologists on the subject of economic inequality and its relation to the health of populations. Socioeconomic status is an important source of health inequity, as there is a very robust positive correlation between socioeconomic status and health [16]. This correlation suggests that it is not only the poor who tend to be sick when everyone else is healthy, but that there is a continual gradient, from the top to the bottom of the socio-economic ladder, relating status to health. Moreover, Different Socioeconomic statuses have a strong relationship with different dietary intakes [8,9]. This present study was conducted as very little information about the nutritional status of General population is known in Rawalpindi. Recent studies in Rawalpindi on Nutritional assessment were mainly on pregnant women and were conducted in hospital setup therefore there was a dire need to have a study for nutritional assessment of General population to establish a basic information and data to enable government and non-governmental organizations to formulate policies for the well-being of population of Rawalpindi as this population forms a major contribution in the population of Pakistan.

**METHODOLOGY:**

This cross-sectional study was conducted in Bahawalpur for the duration of six months from January 2020 to June 2020. This study was among the general population in which 216 persons were enrolled. According to gender distribution there were 108 people male and 108 were female. Their age was from 11 years to 40 years.

The members of the study were divided into 03 groups. Group A consist of member of less than 18 years, group B consist of member of more than 18 years, group C consist of member of more than 30 years. All married, unmarried, healthy willing persons were included after getting informed consent; they filled the forms. Study tool was the structured Questionnaire. Confidentiality of all the data was ensured. A questionnaire was designed to see the status of nutrition and association of anemia. Measuring tapes, weighing scales (analogue) and stationery were used for the collection of data. Body mass index (BMI) was calculated by using the formula weight (Kg)/height (m<sup>2</sup>).

The participant standing at the center of the scale and not holding anything, adjusting scale at zero. Measurement taken from heel to knee, knee to hip, hip to shoulder and shoulder to top of the head. BMI was calculated and categorized in to four groups.

1. Obese BMI of more than 30 kg/m<sup>2</sup>
2. Overweight BMI OF 25-29.9 kg/m<sup>2</sup>
3. Normal BMI of 19.8-24.9 kg/m<sup>2</sup>
4. Underweight less than BMI of 19 kg/m<sup>2</sup>

Food Frequency Questionnaire was filled by participants by recalling dietary intake during last one week. Pilot testing of questionnaire was carried out and editing of questionnaire was done accordingly. Level of Hemoglobin was checked by taking the blood samples of all the participants. Anemia was classified by assessing the normal level of HB as follows:

**Table No 01: Normal Level of Hb According to Age**

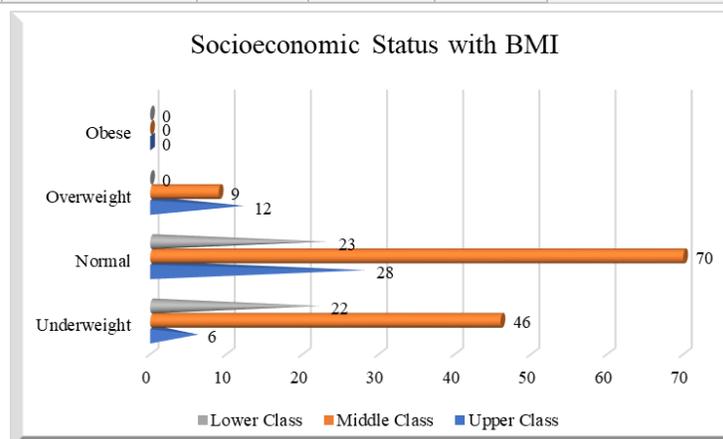
Gender	Age	HB Level (g/dl)
Female	12-18 years	12.0-16.0
	>18 years	12.1-15.1
	Middle age	11.7-13.8
Male	12-18 years	13.0-16.0
	>18 years	13.6-17.7
	Middle age	12.4-14.9

### RESULTS:

The anemia was more prevalent in children, < 18 years, as compared to peoples above 18 and middle age group people. The division of participants according to socio-economic status was like, 46 in upper class, 125 of middle class and 45 lower class. (Table2)

**Table No 02: Relationship of Socioeconomic Status with BMI**

Class	Underweight	%age	Normal	%age	Overweight	%age	Obese
Upper Class	6	13.05%	28	60.87%	12	26.08%	Nil
Middle Class	46	36.8%	70	56%	9	7.2%	Nil
Lower Class	22	48.89%	23	51.11%	Nil		Nil

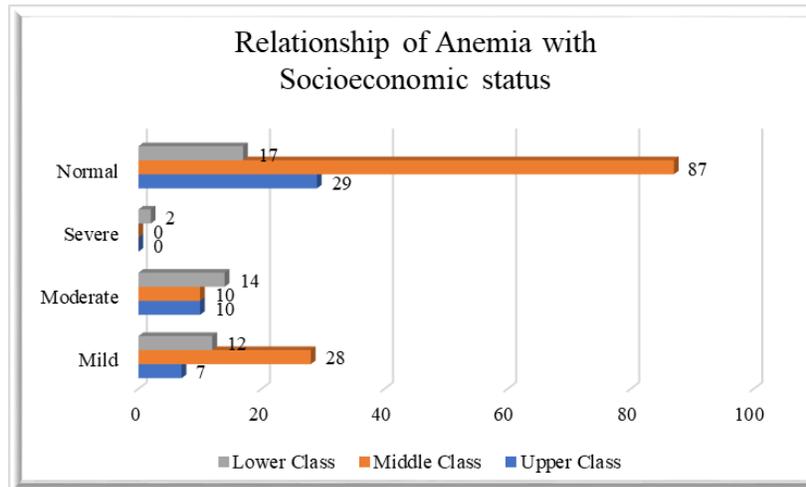


There were more overweight participants in the upper class as compared to middle and lower class. Maximum number of underweight participants were in lower class. There was no obese participant in all the three socioeconomic classes. (Table 2)

More people were affected with anemia in lower class as compared to others. There were 62%, 43.6%, 37% people affected with anemia in lower, middle and upper class respectively. (Table 3)

**Table 3: Relationship of Anemia with Socioeconomic status:**

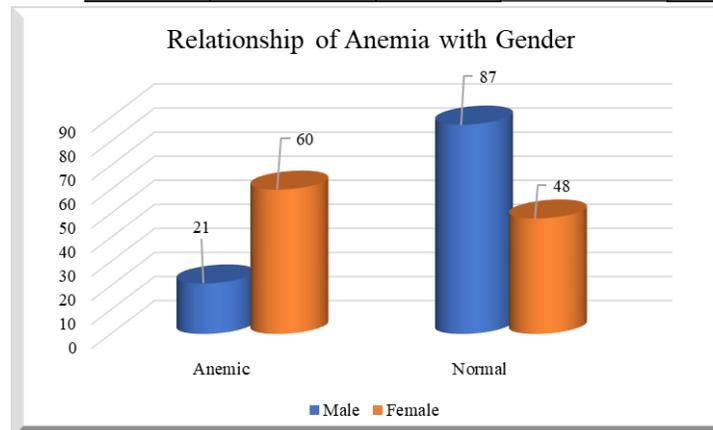
Class	Total	%age	Mild	%age	Moderate	%age	Severe	%age	Normal	%age
Upper Class	17/46	37%	7	15.20%	10	21.75%	Nil		29	63.05%
Middle Class	38/87	43.6%	28	22.4%	10	8%	Nil		87	69.65
Lower Class	28/45	62%	12	26.67%	14	31.11%	2	4.44%	17	37.78%



The frequency of anemia was far more in females than in males. More than half of the females were suffering from Anemia. (Table 4)

**Table No 04: Relationship of Anemia with Gender.**

Gender	Anemic	Percentage	Normal	Percentage	Total
Male	21	19.45%	87	80.56%	108
Female	60	55.56%	48	44.44%	108



The intake of fruits, vegetables, milk and eggs showed no association with the anemia, however, those participants that were taking milk, meat, fruits and vegetables were mostly having hemoglobin level in normal range. Participants that were taking fats and oils more than 4 times a week were mostly overweight. Moreover, none of the participant taking meat and meat products more than 4 times a week had anemia.

**DISCUSSION:**

The noticed correlation among anemia and child's age has been stated in numerous other studies globally,

likewise nutritional anemia was more common in children below 18 years as associated to other two groups [10]. We observed in this study that anemia had

a strong association with gender as occurrence of anemia amongst females was more than 55% as compared to males that had anemia in only 19.45% of the participants.

Moreover, severe anemia was only found in females. One reason was male preferred families in Rawalpindi, more diet was given to male members as compared to female members of the house. This practice was more common in lower socio-economic class. My study is to findings are similar with Jones *et al* (2019) who found more obesity and anemia in females as compared to males [11]. According to the socioeconomic status more underweight were found among participants of Lower class due to under-nutrition and more overweight were found among participants of Upper class due to intake of fatty meals. So overweight was found to be a problem of participants of upper class and under-nutrition and underweight was found to be a problem of lower class [12]. The results are similar to other studies where the anemia was associated with low socioeconomic groups and with obese people [13,14].

The intake of Fruits, vegetables, milk and eggs have no statistical association with the hemoglobin level but participants taking meat and meat products more than 4 times a week were not found to have anemia at all [15]. An interesting thing that was found among the participants that those participants which were educated or the adolescents whose parents were educated were mostly normal and the un-educated participants from any class even if they were from upper socioeconomic class were mostly either overweight or underweight [16].

### CONCLUSION:

At the end of this study we found that most of the female participants were having anemia. There was a significant relation among the consumption of meat and hemoglobin level. So special measures should be taken to provide dietary education especially to females to have healthier mothers in the future.

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